Preventive ear surgery

Dogs with chronic otitis externa can lead better lives with a lateral ear canal resection.

Pets with persistent otitis externa endure painful recurring ear infections. To help reduce these episodes and prevent harmful ear damage, you can recommend surgery—specifically, a lateral ear canal resection. This is preventive surgery, so the adage “To cut is to cure” does not apply. Although the surgery won’t eliminate otitis externa or prevent future ear infections, it will greatly benefit Pets and their families by improving the health of Pets’ ears and their hearing (Table 1). In addition, early surgical intervention is often more effective than trying to only medically manage chronic ear infections throughout the Pet’s lifetime.

Indications and contraindications for surgery

When Pets present with their first otitis externa episode, it’s time to broach the subject of lateral ear canal resection surgery with the client. If the Pet develops more than three acute infections within a 12-month period, you should recommend surgery to try to 1) reduce the chance of recurring infections, 2) prevent serious damage to the ear and 3) facilitate lifetime management of the disease. Do not approach each new ear infection as a new disease process. And don’t wait until the disease makes the unavoidable progression from chronic otitis externa to otitis media, which can result in hearing deficits. Successful results depend on performing the lateral ear canal resection early—before chronic changes occur.

In breeds that are predisposed to ear problems (i.e., those with pendulous ears, stenotic canals, heavy hair coats and increased apocrine [ceruminous] glands), you should consider intervening even sooner. Discuss this

<table>
<thead>
<tr>
<th>Table 1: Benefits of Lateral Ear Canal Resection</th>
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<tr>
<td>■ Increases ear canal drainage and ventilation</td>
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<tr>
<td>■ Reduces ear canal temperature</td>
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<td>■ Facilitates ear cleaning and treatment</td>
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<td>■ Reduces ear odors</td>
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<td>■ Reduces the number of otitis recurrences and the amount of accompanying pain</td>
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<td>■ Decreases treatment time for recurrences</td>
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<td>■ Drastically improves quality of life for the Pet and family</td>
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<td>■ Enhances the Pet-family bond</td>
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issue with clients early so they can take a proactive approach in their Pet’s care.

Surgery is no longer an option if otitis externa has progressed too far. Contraindications for surgery include:

- Severe ear canal obstructions, canal stenosis or calcification
- Concurrent otitis media, unless performed in conjunction with a ventral bulla osteotomy
- Severe epithelial hyperplasia.

If a patient presents with any of these contraindications for lateral ear canal resection surgery, it is best to recommend a total ear canal ablation with a lateral bulla osteotomy.

The purpose of lateral ear canal resection surgery is to prevent or slow the progression of pathological changes that occur with chronic otitis externa. Any primary, predisposing or perpetuating factors that contribute to otitis should be managed in conjunction with the surgery to achieve better outcomes (see Managing otitis, page 32).

Communicating with clients

It’s essential to set realistic expectations with clients about the extent of ear disease, outcomes from surgery and the long-term prognosis for the Pet’s health. Clients need to realize that surgery will not cure or prevent future ear infections but will reduce and control the severity and number of episodes, thus decreasing the pain the Pet would likely endure.

It’s also important to discuss the cost of presurgery requirements (i.e., examination, blood work and radiographs), surgery and follow-up care with the client and to develop a lifetime treatment plan for the Pet. Clients need to know early on that the Pet will require additional sedation and a few hours of hospitalization two weeks after the initial surgery when the sutures are removed. Also tell them about the costs associated with a lifetime treatment plan (see Bend clients’ ears, page 14).

In addition to facts and costs, clients need reassurance. Offer it by stressing that Pets will receive proper pain medication throughout the entire surgical process and at home. Also ease clients’ anxieties by reminding them that, although Pets will be lethargic for a day or two, they will fully recover emotionally and physically by two to three weeks after the surgery.

Finally, if surgery is performed later than recommended, you must inform the client—before surgery—that another surgical procedure may be necessary, depending on the disease progression. This is an appropriate time to discuss a total ear canal ablation with lateral bulla osteotomy.

Preoperative preparations

Preoperative work starts with reviewing the Pet’s history, including hearing deficits and the number of acute episodes. You should also perform a thorough physical examination to establish the Pet as an appropriate surgical candidate. Check the ear canal skin for concurrent ear-disease related problems, and visualize the tympanic membrane to ensure its integrity. After the examination, take skull radiographs that focus on the bulla to check for concurrent otitis media requiring treatment or surgery.

Less than 48 hours before surgery, conduct a complete blood count (CBC), differential, and serum chemistry panel and perform culture and sensitivity testing on the horizontal ear canal. If the results are abnormal, perform additional blood analysis to help identify concurrent disease so it can

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Clip the entire side of the face and both sides of
the pinna of both ears since you will be doing a
bilateral procedure.

Identify the transition of the vertical canal to the
horizontal canal, and mark the position with a
dot.

With lines, mark the position of the rectangular
skin incision, which should be 1.5 times the
length of the vertical canal and 5 mm from each
side of the vertical canal.

Flush the canal with a mild-strength 0.2% chlor-
hexidine solution only, unless you are absolutely
sure the tympanic membrane is intact.

Surgically prepare the clipped face and pinna.

Position the patient in lateral recumbency with
the head elevated.

Drape the surgical area, including the entire pinna.

Begin surgery by making two parallel skin
incisions lateral to the vertical ear canal, fol-
lowing the marks and joining them at the
bottom to form a rectangle.

Avoid damage to the parotid salivary gland,
which may appear at the ventral aspect of
the incisions.

The facial nerve and branches of the great
auricular artery lie very deep, close to the
bulla, so you will not encounter them.

Starting ventrally, dissect the skin flap
dorsally, staying close to the cartilage
of the canal and leaving the flap attached
dorsally to use as a handle.

Dissect the canal from the surrounding
tissue, staying close to the cartilage to
expose 75% of the lateral aspect of the
vertical canal.
Identify the perichondrium at the transition of the vertical canal to the horizontal canal by digital palpation, using your index finger with the fingernail next to the canal. The perichondrium serves to strengthen the ear canal as it turns toward the skull.

Starting halfway down the vertical canal, slide your finger downward. Remember to compress the vertical canal sufficiently to identify the perichondrium. It will feel like a bump and provide resistance as an indication not to progress further down the canal.

Use a 20-ga needle as a flag to help confirm the position of the perichondrium during surgery. Place the needle 3 mm dorsal to the perichondrium and then thread it through the cartilage and into the vertical canal, bisecting the canal. Remember to keep the needle perpendicular to the canal.

While using the skin flap as leverage, make two parallel incisions, one at 9 o'clock and the other at 3 o'clock, with a straight scissors that will transect the cartilage of the canal in half. Remember to be careful not to let the incisions converge into a “V” shape.

Do not transect the perichondrium. Use the 20-ga needle as a guide to stop transection of the canal. If you transect the perichondrium, the horizontal canal will collapse and destroy all the benefits of the surgery.
With the skin attached, reflect the lateral half of the canal cartilage flap with the skin remaining distally.

Inspect the opening of the horizontal canal, and make adjustments to the cartilage flap as needed by cutting further on one or both sides of the vertical canal, remembering not to transect the perichondrium.

If the cartilage flap does not lie flat, score or delicately remove a shallow “V” from the underside to facilitate it. Remember not to disturb the perichondrium.

To close cartilage to skin, use 3-0 or 4-0 monofilament suture.

To ensure initial alignment of the cartilage drain board, first place two opposing sutures at the ventral horizontal level of the ear canal.

Do not hesitate to remove these first sutures to make further adjustments as previously described. Then, replace sutures to recheck alignment.

Proceed when you have achieved optimal alignment and suture positioning.
Resect the cartilage flap at the appropriate length to align it with the distal portion of the rectangular skin incision, creating the drain board.

- Be careful not to make the drain board too short, as it should be half the length of the vertical canal cartilage flap.

- Suture the cartilage drain board to the skin without tension, placing the first suture ventrally in the center of the short leg of the rectangle.

- Using suture tension operatively in an attempt to hold the horizontal canal entrance open will fail during healing because of skin elasticity. Making the appropriate adjustments as previously described during surgery will ensure an optimal canal opening.

- Suture the corners and cranial and caudal aspects of the drain board to the skin.

- Finally, suture the cranial and caudal aspects of the remaining half of the vertical canal to the skin.
### Table 2: Anesthesia and Pain-Management Protocols for Lateral Ear Canal Resection*

| Optional premedication | If possible, apply an appropriately dosed fentanyl patch 12 to 24 hours before surgery:
|------------------------|--------------------------------------------------|
|                        | - <11 lbs: one-half of a 25-µg patch
|                        | - 11-22 lbs: 25-µg patch
|                        | - 23-44 lbs: 50-µg patch
|                        | - 45-66 lbs: 100-µg patch

| Premedications | Monitor monitoring parameters: Electrocardiogram, Pulse oximetry, Physical monitoring of vital signs by PetNurse
|----------------|------------------------------------------------------------------------------------------------------------------|
| Cardiovascular parameters | Administer 0.025 mg/lb acepromazine subcutaneously or intramuscularly (maximum dosage: 1.5 mg). Also administer 0.2 to 0.5 mg/lb morphine intramuscularly only (maximum dosage: 5 mg). Wait for 30 minutes after administering premedications to assess cardiovascular parameters and proceed to induction (up to a three-hour maximum). If over three hours, repeat premedications at one-half dosage before induction.

| Induction | Administer 0.5 to 1 mg/lb Telazol (Fort Dodge Animal Health; diluted with sterile water to a 1- to 3-ml volume) intravenously (maximum dosage: 100 mg) to allow intubation. Telazol reduces the need for higher levels of sevoflurane to control head movement during surgery.
|-----------|------------------------------------------------------------------------------------------------------------------|
| Maintenance | Start sevoflurane at 1 to 1.5%. Do not use an overpressure technique to prevent excessive anesthetic depth during the initial phases of general anesthesia, because Telazol is the induction agent. For maintenance, administer sevoflurane to effect at 1 to 4%, inhaled.
| Support | Administer 2.5% dextrose and 0.45% sodium chloride (NaCl) at 5 to 10 ml/lb/hr intravenously. Maintain core body temperature using appropriate methods.

*To achieve better outcomes in Pets with concurrent controlled diseases, select the appropriate anesthesia and pain-management protocol for that Pet.

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be resolved before surgery.

If blood work results are within normal limits—and any concurrent diseases are under control—you may schedule the surgery. When the surgery date arrives, place an intravenous catheter and follow the anesthesia and pain management protocols outlined in Table 2, or use other appropriate protocols for patients with controlled concurrent diseases. Remember, ear infections are painful, and ear surgery increases the pain level until healing is complete.

Also, administer cefazolin (22 mg/kg intravenously) unless the patient is receiving another appropriate antibiotic preoperatively and can continue receiving it during hospitalization.

### Surgery and postoperative considerations

Lateral ear canal resection surgery is easy to perform during the early stages of disease. Once you are comfortable with the procedure, it should take less than 30 minutes per ear to complete. The necessary surgical skills include identifying anatomical landmarks, planning and marking the skin incision location, controlling major bleeding, dissecting the subcutaneous tissue, transecting and appropriately amputating the lateral half of the vertical ear canal, and suturing the surgical margins. For a discussion of technique, see Figures 1-9 on pages 44 to 47.

PetNurses should monitor the Pet’s vital signs using a pulse oximeter and an electrocardiograph throughout surgery, extubation and sternal recovery. To manage pain, repeat the premedica-
tion morphine dosage (Table 2, page 48) every four to six hours during hospitalization. Once the Pet has sufficiently recovered from anesthesia, apply an Elizabethan collar to prevent iatrogenic surgical site trauma.

Homeward bound
Before reuniting the Pet and client after surgery, remove the fentanyl patch if it was applied (Table 2, page 48). This will prevent any potential problems that could arise regarding disposal or improper use.

Next, take the client to a quiet exam room where you can carefully review home care instructions without interruptions or distractions. Slowly review each point, and make sure clients understand and feel comfortable completing the assigned tasks. Ask them several times if they have any questions. This is a good time to discuss that the Pet will look different because of the surgery. Be sure to prepare clients to see that their dog’s head has been shaved and that the surgical site and sutures will be visible.

After reviewing the home care instructions with the client, dispense enough medication (Etogesic—Fort Dodge Animal Health, 10-15 mg/kg orally once daily) for seven to 10 days of pain management, then review the dosage instructions. Remind clients that the Elizabethan collar must remain on the Pet at all times until the sutures are removed.

At this time, ask the PetNurse to provide clients with written home care instructions and a telephone number to call if they have any questions or concerns. PetNurses should also 1) inform clients that a team member will be calling to check on the Pet’s recovery, 2) remind clients that the follow-up appointment to remove the sutures will likely require sedation and hospitalization for the day and 3) accompany clients to the front desk to pay for services, schedule a follow-up appointment in 14 days and receive an estimate for the follow-up appointment.

Finally! You can reunite the Pet and the client. Remind clients that Pets will appear lethargic during the first few days of recovery but will regain their appearance and disposition within a few weeks. This is a good time to review the surgery process, show them the surgical site and explain how they should monitor the ear for any changes or infection. It is also appropriate to commend them for making the right decision for their Pet. Don’t forget to ask clients if they have any other questions before leaving the hospital.

Veterinarians can manage chronic otitis externa effectively by taking a preemptive approach. Remember, medically managing this disease is not always possible, and surgery may help. When appropriately implemented, lateral ear canal resection surgery enhances the Pet’s quality of life and strengthens the Pet-family bond.

References

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